Table 6-4
Cost Estimate Assumptions, Notes, and Limitations for Soil
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

Assumptions, Notes, and Limitations
1. **Estimated Quantities** In many cases the areas or volumes have been assumed or obtained from reports prepared by others. The estimated quantities (e.g., length, areas, or volumes) that have been used in the development of the cost estimates should be verified before construction. It is assumed that the work will be done in Level D personnel protective equipment (PPE) and by non-union labor.
2. **Unit Costs** The estimated unit costs are based on Geosyntec's experience and published information such as RSMeans. The costs that have been developed should be considered only as a relative guide. A range of unit costs have been applied to items with high variability.
3. **Areas of Particular Concern (APCs)** APCs are generally defined as areas with soil concentrations greater than 3 times the remedial goal and include POI-09, POI-14, SS-109 (i.e., TP-09), SS-90, SS-97, SS-103, and SS-118. One acre of soil remedy was assumed for each APC.
4. **Capping** A Resource Conservation and Recovery Act (RCRA) Subtitle D landfill capping system was assumed for the capping system as residential future use is not anticipated. However, the goal of capping in Alternatives 3, 4, and 5 is to protect human and ecological receptors and attainment of this goal may not require a Subtitle D-compliant capping system; the final cap design will be prepared during the remedial design phase. In some areas, the limits of cap are expected to extend into open water. In such cases, the cap in these areas will need to be terminated in water to limit contact between waste and water. These areas are expected to include waste relocation edges, existing ponds adjacent to waste, and portions of the landfill perimeter within wetlands. It is assumed a cap would be installed and terminated in an anchor trench at the toe of the excavation. The purpose of the anchor trench is to prevent horizontal migration of constituents in the landfill to the adjacent open water. Placement of geomembrane caps may be difficult in saturated conditions (i.e., cost per acre would be expected to increase). In those areas, it was assumed that the cap would be extended into an 'enhanced' anchor trench. As part of this cost estimate, an anchor trench has been included around the portions of the landfill (e.g., ponds, open water, etc.). It was assumed that the slope above the anchor trench around the perimeter (fringe area) is expected to require additional work as part of the wetland wildlife habitat mitigation strategy. The transition along the cap fringe area is expected to include a riparian zone with a transition zone to open water. Within this transition area, it was assumed that the Agencies will require additional features to be installed. These features could include construction of landforms, such as turtle hummocks, brush barriers, etc. and plantings. An estimate has been made to cover the cost to micro-grade a 100-ft wide area up slope of the anchor trench.
5. **On-Site Soil Reuse** Based on cost evaluations, on-site soil reuse is less cost effective than imported soils because on-site soil may require soil dewatering and wetland impact mitigation, which likely results in importing the same amount of offsite soils as the onsite soil excavated for reuse.

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6. **Flood Hazard Area (FHA)** As the Site is partially located in a regulatory FHA, it will be necessary to achieve a balanced cut and fill grading plan for the landfill closure or placing soil for vegetation within the FHA. If a cap is to be constructed within the FHA, the uppermost 3 feet of landfilled material would be removed and relocated to the upper area of the landfill (i.e., outside of the FHA) before cap construction.
7. **Wetland Impact Mitigation** Regulations, under the Freshwater Wetland Protection Act (NJAC 7:7A) provides the following guidelines for wetlands mitigation. • Creation or Restoration. • Enhancement: Does not include the addition of human-made habitat improvement devices such as duck boxes nor the removal of trash or debris. Compensation ratio can range from 3:1 to 10:1 or more, depending upon the ecological benefit provided by the enhancement activities. • Mitigation Bank or Monetary Contribution, Preservation, or Land Donation (for offsite replication): Mitigation banks are available within the State but currently not within the Site's watershed. To better understand the Agencies expectations regarding the wetland impact mitigation strategy, a pre-permitting consultation with New Jersey Department of Environmental Protection (NJDEP) would be necessary. A counter argument for wetland mitigation under the New Jersey Freshwater Wetlands General Permit for hazardous and landfill closures (NJAC 7:7A-5.4 and 5.5) suggests that mitigation may not be required for disturbance of wetlands located on top of the landfill, or on the intermediate or permanent cover of the landfill. Resolution of this issue will need to be discussed with the Agencies. The cost estimate only takes into consideration that when construction disturbs wetlands the restoration will be on a 1:1 basis and does not include any additional mitigation that the Agencies could apply and that when wetlands are capped, the offsite replication will be on a 1:1 basis and does not include any additional mitigation that the Agencies could apply.
8. **Wildlife Protection** A June 2008 endangered species and critical habitat survey identified two areas of potential bog turtle habitat adjacent to the Site (Amy S. Green Environmental Consultants). Best Management Practices (BMPs) are expected to be required through coordination with the Agencies including the U.S. Fish and Wildlife New Jersey Field Office protect 'critical' habitat during construction. The two areas of potential bog turtle habitat include: (a) 35.31 acres along the western boundary of the landfill and (b) 10.89 acres in the northeastern portion of the landfill. Potential BMPs may include structural (e.g., reinforced silt fence, active management of turtles, etc.,) or non-structural (e.g., restrict construction during turtle nesting season). For purposes of this cost estimate, only the cost of structural BMPs has been estimated.
9. **Well Restriction** New Jersey regulation (NJAC 7:9D-2.3[a]) prohibits installation of potable wells with casings less than 50 feet in depth. It is expected that the non-potable existing well will be decommissioned.

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10. **Groundwater Monitoring Network** No costs have been included to address groundwater. These are addressed under the groundwater alternatives. If Groundwater Alternative 1 (No Action) is selected as the remedy for groundwater, some additional costs will be incurred for long-term monitoring related to the landfill, independent of groundwater remediation.
11. **Contingency Cost** The cost estimates do not include contingency costs (e.g., handling of unforeseen liquid or hazardous wastes found in drums or other containers). It is assumed that existing structures to be demolished have no hazardous materials and can be disposed of (consolidated) on-site.
12. **New Jersey Licensed Site Remediation Professional (LSRP)** The opinion of an LSRP may be required during construction; these costs have not been included.
13. **Britten Road** Only an asphalt overlay will be required to restore Britten Road after construction as needed.
14. **Construction Access Road** It was assumed a temporary access road with a length equivalent to half the perimeter of the Site will be constructed.
15. **Clearing and Grubbing** The clearing and grubbing unit cost is expected to vary according to the type of existing vegetation (forested or vegetated).
16. **Upland Area Disturbance** The cost estimates do not include the cost for mitigation of the disturbed upland areas (e.g., mature forest).
17. **Passive Gas Vent System** A passive gas vent system will consist of vertical above ground vents tied into a gas vent layer or a horizontal pipe in a gravel trench constructed under the cap.
18. **Function and Value Assessment** It is assumed sufficient information has been collected to satisfy a function and value assessment for the existing ponds and the 8.3 acres of ponds on or adjacent to the landfill will not require any major retrofits for the management of stormwater from the cap. Where waste exists along a pond perimeter, a cap extension will be installed. No dewatering costs have been included.

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19. **Access Control Fence** It is assumed that an access control perimeter fence will be installed only on the sides of the landfill adjacent to private property (i.e., no fence will be installed on the boundary with Great Swamp National Wildlife Refuge).
20. **Excavation of Impacted Soils** As historic data indicate impact to soils in APCs is limited to a depth less than 2 ft below ground surface, it is assumed the top 2-ft of soils of APCs and/or the top 2 to 4-ft of 25-acre selected area (Functional Area 1) will be excavated for consolidation under a cap or offsite disposal, depending on selected alternatives. For offsite disposal, it was assumed 50% of excavated soil is non-hazardous waste and the remaining 50% is hazardous waste. It was also assumed the hazardous and non-hazardous waste disposal facilities are available within 30 miles from the site.
21. **Vegetation of Mostly Non-Vegetated Areas** It is assumed that 50% of the non-vegetated areas can be vegetated by scarifying, fertilizing, and seeding, and the remaining 50% of the non-vegetated areas will require placement of 2-ft thick vegetative support soils (e.g., loam) and seeding. It is also assumed that all non-vegetated areas are located outside of the FHA and therefore flood storage loss compensation for the placement of 2-ft thick soil is not considered.
22. **Post-Remedy Operation and Maintenance** 30 years of operations and maintenance for capped areas and fence and 5 years of maintenance for wetland mitigation areas were assumed. An annual inflation rate of 2.5% was assumed. It was assumed that approximately 1 to 3% of the initial construction costs of the perimeter fence and vegetation of non-vegetated areas will be needed for annual maintenance.
23. **Construction Duration** The assumed construction durations are based on Geosyntec's experience of project with similar scopes. Depending on contractor and their work plan/strategy/experience, weather conditions, and/or unforeseen site conditions (e.g., high value wildlife), a construction duration (and thus overall construction cost) may vary significantly.